What is claimed is:

1. A method of patterning a substrate surface comprising:
at least partially covering the surface with a first plurality of molecules;
selecting at least one internal bond from the plurality of molecules; and
reacting the at least one internal bond to form at least one second functional group.

2. The method of claim 1 further comprising reacting the at least one second functional group with a reactant.

3. The method of claim 1 wherein the first plurality of molecules contain at least one first functional group.

4. The method of claim 3 further comprising reacting the at least one first functional group with a reactant.

5. The method of claim 3 further comprising reacting the at least one second functional group with a reactant.

6. The method of claim 1 wherein the step of reacting is reacting with at least one electron.

7. The method of claim 6 wherein the at least one electron is provided with a scanning probe microscope tip.

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8. The method of claim 6 wherein the at least one electron is patterned using a mask.

9. The method of claim 6 wherein the at least one electron is provided with an electron beam.

10. The method of claim 9 wherein the electron beam is a scanned electronic beam.

11. The method of claim 6 wherein the at least one electron is patterned using projection.

12. The method of claim 1 wherein the step of reacting is reacting with at least one photon.

13. The method of claim 12 wherein the step of reacting is patterned using a mask.

14. The method of claim 12 wherein the photons are provided using a scanning probe microscope.

15. The method of claim 12 wherein the photons are directed using a scanning probe microscope.

16. The method of claim 1 wherein the step of reacting is reacting with heat.

17. The method of claim 16 wherein the heat is provided with a scanning probe microscope tip.

18. The method of claim 1 wherein the step of reacting is reacting with at least one ion.

19. The method of claim 18 wherein the at least one ion is provided by an ion beam.

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20. The method of claim 18 wherein the at least one ion is patterned using a mask. A

21. The method of claim 18 wherein the at least one ion is patterned using projection.

22. The method of claim 1 wherein the substrate is selected from the set comprising silicon, silicon oxide, gold, silver, copper, gallium arsenide, aluminum oxide, and titanium oxide.

23. The method of claim 1 wherein the substrate is selected from the set comprising metals, semiconductors, insulators, and superconductors.

24. The method of claim 1 wherein the substrate comprises a plurality of materials.

25. The method of claim 24 wherein the plurality of materials is organized in patterns.

26. The method of claim 25 wherein the patterns are stripes.

27. The method of claim 26 wherein the patterns contain one or more geometric shapes.

28. The method of claim 25 wherein the patterns are nanopatterns.

29. The method of claim 1 wherein the substrate is a nanoparticle.

30. The method of claim 1 wherein each of the first plurality of molecules are bound to the surface.

31. The method of claim 28 wherein each of the plurality of molecules are covalently bound to the surface.

32. The method of claim 1 wherein the first plurality of molecules is disposed on a film covering the substrate surface.

33. The method of claim 32 wherein the film includes a monolayer of molecules.

34. The method of claim 33 wherein the monolayer of molecules is placed by selective attachment.

35. The method of claim 33 wherein the monolayer of molecules is placed by selective chemical attachment.

36. The method of claim 32 wherein the film includes a portion of a monolayer of molecules.

37. The method of claim 36 wherein the portion of the monolayer of molecules is placed by selective attachment.

38. The method of claim 36 wherein the portion of the monolayer of molecules is placed by selective chemical attachment.

39. The method of claim 32 wherein the film includes a portion of a multilayer of molecules.

40. The method of claim 39 wherein the portion of a multilayer of molecules is placed by selective attachment.

41. The method of claim 40 wherein the portion of a multilayer of molecules is placed by selective chemical attachment.

42. The method of claim 32 wherein the film includes a multilayer of molecules.

43. The method of claim 42 wherein the multilayer of molecules is placed by selective attachment.

44. The method of claim 43 wherein the multilayer of molecules is placed by selective chemical attachment.

45. The method of claim 1 further comprising processing the patterned surface via chemical exposure.

46. The method of claim 1 further comprising processing the patterned surface via heat.

47. The method of claim 1 further comprising processing the patterned surface via light.

48. The method of claim 1 wherein the at least one internal bond is a labile bond.

49. The method of claim 1 wherein the step of reacting is dissociating.

50. The method of claim 1 wherein the step of reacting is dimerizing.

51. The method of claim 1 wherein the step of reacting is polymerizing.

52. The method of claim 1 wherein the step of reacting is crosslinking.

53. The method of claim 1 wherein the substrate surface is created with nanolithography.

54. A method of patterning a substrate surface comprising:
overlaying at least one layer of molecules on at least a portion of the substrate surface;
selecting a plurality of molecules within the at least one layer; and
reacting at least one internal bond of each of the plurality of selected molecules to provide a functional terminal group.

55. The method of claim 54 further comprising reacting at least a portion of the substrate surface to pattern the substrate surface.

56. The method of claim 55 wherein the at least a portion of the substrate surface includes at least a portion of the selected plurality of molecules.

57. The method of claim 55 wherein the at least a portion of the substrate surface excludes the selected plurality of molecules.

58. The method of claim 54 further comprising reacting the terminal function group to pattern the substrate surface.

59. The method of claim 54 wherein the substrate surface is a nanostructure.

60. A device comprising a structure having at least one patterned surface, the at least one patterned surface patterned by overlaying the surface with a first plurality of molecules, selecting at least one internal bond of the plurality of molecules, and reacting the at least one internal bond to form at least one second functional group.

61. The device of claim 60 wherein the structure is a nanostructure.

62. The device of claim 61 wherein the patterned surface is a nanostructure.

63. The device of claim 61 wherein the patterned surface is a patterned surface for cell growth.

64. The device of claim 61 wherein the patterned surface is a patterned surface for cell placement.

65. The device of claim 61 wherein the patterned surface is used in creation of a chemical sensor.

66. The device of claim 61 wherein the patterned surface includes at least one chemical sensor.

67. The device of claim 61 wherein the patterned surface is used in creation of a biological sensor.

68. The device of claim 61 wherein the patterned surface includes at least one biological sensor.

69. A method of patterning a substrate surface at a molecular level comprising:

at least partially covering the surface with a first plurality of molecules;

individually selecting at least one molecule from the plurality of molecules;

individually selecting at least one internal bond from the selected at least one molecule; and

reacting the at least one internal bond to form at least one second functional group.

70. The method of claim 69 wherein the first plurality of molecules contain at least one first functional group, the first functional group different from the second functional group.